

PATENT SPECIFICATION

(11) 1 274 538

DRAWINGS ATTACHED



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(21) Application No. 54405/69 (22) Filed 6 Nov. 1969

(23) Complete Specification filed 7 Sept. 1970

(45) Complete Specification published 17 May 1972

(51) International Classification H01R 3/02

(52) Index at acceptance

H2E 14 16 5 9B

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(54) CONNECTOR FOR FLAT CABLE, METHOD OF APPLYING IT AND THE CONNECTION FORMED.

(71) We, AMP INCORPORATED, a corporation organised and existing under the laws of the State of New Jersey, United States of America, of Eisenhower Boulevard, Harrisburg, Pennsylvania, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a connector for a flat cable, by which is meant a cable having spaced generally co-planar conductors embedded in insulating laminae, as in ribbon and tape cable, or an insulated printed circuit comprising spaced conductors on a rigid or flexible insulating support with an insulating film on the exposed face of the conductor.

A problem with such flat cables is the need to remove insulation in connecting a conductor of the flat cable to a contact post.

An electrical connector for flat cable, according to the invention, comprises a planar base formed from sheet metal, the planar base having a pair of spaced aligned crimping ferrules, each crimping ferrule having a channel configuration and including a pair of ears struck up from the planar base, one on each side of a part of the planar base defining a web of the crimping ferrule, the planar base being formed between the crimping ferrules with a post receptacle.

Preferably the post receptacle is formed at or adjacent the midpoint of an elongate sheet metal base and a crimping ferrule is formed between the post receptacle and each end of the elongate base so that the connector can be crimped to a conductor at two positions spaced longitudinally of the conductor. Preferably the connector is sufficiently wide to underlie and support the insulation lands on opposite sides of the conductor.

In a preferred method, a connector of the invention is so located adjacent a flat cable conductor that the crimping ears lie laterally of the conductor and are crimped to the cable by being forced through the insulation

lands and then folded over to contact the face of the conductor remote from the connector base. The flat cable so connected is advanced to a contact post, for example a contact pin extending from an instrument in a panel, and the post receptacle and contact post are force-fitted into telescopic engagement to connect the conductor of the flat cable and the contact post without stripping insulation from the flat cable.

In a preferred form, the invention includes a connection formed of a flat cable and a connector of the invention.

The invention will be described by way of example with reference to the accompanying drawings in which:—

Figure 1 is a perspective view of a length of flat cable;

Figure 2 is a perspective view of a connector of the invention; and

Figure 3 is a perspective view of the connector of Figure 2 crimped to the flat cable of Figure 1.

The flat cable of Figure 1 comprises generally co-planar electrically conductive tracks 1, preferably copper, embedded in and spaced apart by lands 2 of insulating material. Before the tracks 1 were sheathed some were punched with holes 3 in accordance with a pattern of contact posts, not shown, extending generally normally of a rear face of an instrument panel on which the flat cable is to be mounted, as explained below.

The connector of Figure 2 is formed from sheet metal to comprise a flat base 4, generally rectangular in plan. A tubular post receptacle 5 is extruded from the base 4, upwardly as shown in Figure 2, at or adjacent the centre of the base. The receptacle 5 tapers away from the base 4 and the upper end of the receptacle 5 has short slits 6 extending towards the base. A crimping ferrule 7, is formed from the body of the base 4 between the receptacle 5 and each shorter side of the base. Each ferrule 7 is of generally channel cross-section and comprises a pair of spaced apart ears 8 stood up from the base, and lances 9 are struck up from the floor or web of the base between the

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ears 8. The upper edges of the ears may be sharpened. The crimping ferrules 7 may be of the type described and claimed in British Patent No. 1,146,807.

5 In use, connectors are so located under the flat cable that a receptacle 5 of each connector protrudes through a respective hole 3 and the crimping ears lie on opposite sides of the respective conductive track 1. The crimping ears 8 are then crimped to the track 1 by being pierced through the insulating lands 2 on opposite sides of the track 1, and then folded over to extend through the insulation overlying the track 1 electrically to contact the face of the track 1 remote from the base 4, the upper face as shown, and compress the track between the ears and the base. The flat cable so connected is then advanced to the rear face of an instrument panel, not shown, with the holes 3 in alignment with contact pins protruding from the rear face of the instruments and force-fitted on to the panel, so causing the receptacles 5 to be push-fitted over the contact pins, the slits 6 enhancing the engagement of the pins and receptacles. In this way the conductors of a flat cable are electrically connected to contact posts without impairing the insulation sheath of the cable.

30 The post receptacle 5 may be formed separately from the base 4 and then riveted to the base 4 to form a connector of the invention. The base 4 may be so shaped that, in use, the post receptacle 5 protrudes through an insulation land 2 instead of a hole 3 preformed in a track 1.

WHAT WE CLAIM IS:—

40 1. An electrical connector for flat cable, comprising a planar base formed from sheet metal, the planar base having a pair of spaced aligned crimping ferrules, each crimping ferrule having a channel configuration and including a pair of ears struck up from the planar base, one on each side of a part

of the planar base defining a web of the crimping ferrule, the planar base being formed between the crimping ferrules with a post receptacle.

2. A connector according to claim 1, in which the post receptacle is extruded from metal of the base.

3. A connector according to claim 1 or 2, in which the end of the post receptacle remote from the base has slits extending towards the base.

4. A connector according to any of the preceding claims, in which the post receptacle is formed at or adjacent the midpoint of an elongate base and a crimping ferrule is formed between the post receptacle and each end of the elongate base.

5. A method of applying a connector to flat cable, comprising so locating a connector according to any of claims 1 to 4 with respect to the cable that the crimping ears underlie insulation lands on opposite sides of a conductive track by forcing the ears through the insulation lands and folding them to contact the face of the track remote from the connector base.

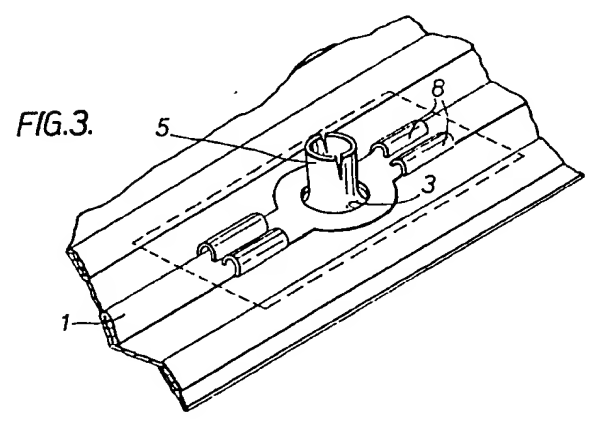
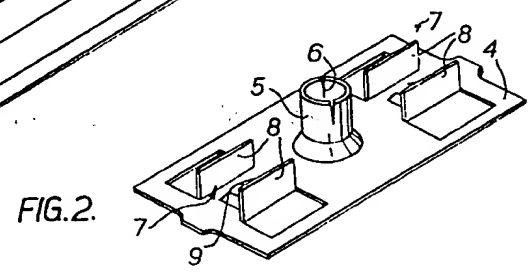
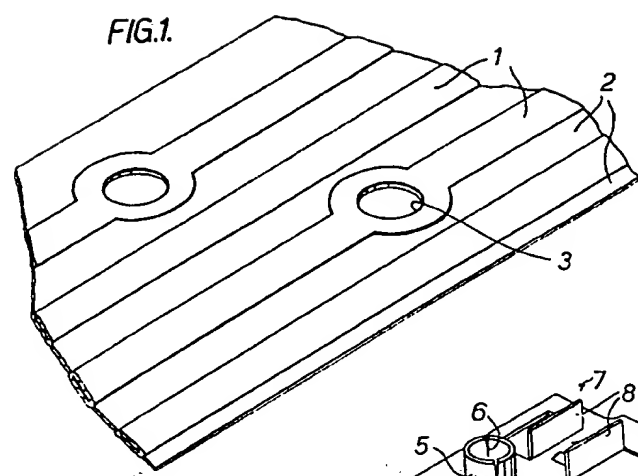
6. A method according to claim 5, in which a hole is preformed in the conductive track and the post receptacle is arranged to protrude through the hole.

7. A connection of a flat cable and a connector according to any of claims 1 to 4 when crimped by the method of claim 5 or 6.

8. An electrical connector substantially described with reference to Figures 2 and 3 of the drawings.

9. A connection of a flat cable and an electrical connector substantially as described with reference to Figure 3 of the drawings.

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